Statement of Verification

BREG EN EPD No.: 000509 Issue 01

This is to verify that the

Environmental Product Declaration

provided by:

RCR Flooring Products Ltd

BRE Global Verified EPD

is in accordance with the requirements of:

EN 15804:2012+A1:2013

and

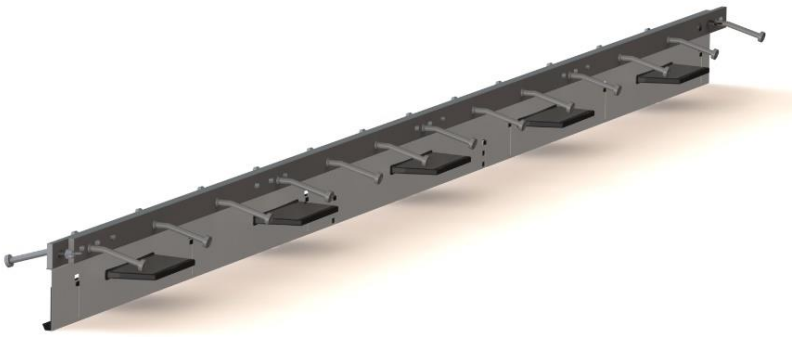
BRE Global Scheme Document SD207

This declaration is for:

1 unit of Alphajoint

Company Address

RCR Flooring Products Ltd
Unit 1C Mill Close
Lee Mill Industrial Estate
Lee Mill
Ivybridge, Devon
PL21 9GL



RCR Flooring Products

Signed for BRE Global Ltd	Emma Baker Operator	16 June 2023 Date of this Issue
16 June 2023 Date of First Issue		15 June 2028 Expiry Date

BRE Global Verified EPD

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ECO PLATFORM EPD VERIFIED

Environmental Product Declaration

EPD Number: 000509

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013
Commissioner of LCA study	**LCA consultant/Tool**
RCR Flooring Products Ltd Unit 1C Mill Close Lee Mill Industrial Estate Lee Mill Ivybridge PL21 9GL	LCA consultant: Roger Connick Tool: BRE LINA v2.0
Declared Unit	**Applicability/Coverage**
1 unit of Alphajoint (33.15 kg)	Product Specific.
EPD Type	**Background database**
Cradle to Gate	ecoinvent v3.2

Demonstration of Verification
CEN standard EN 15804 serves as the core PCR [a]
Independent verification of the declaration and data according to EN ISO 14025:2010 ☐Internal ☒ External
(Where appropriate [b])Third party verifier: Nigel Jones
a: Product category rules b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Comparability
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A1:2013 for further guidance

Information modules covered

Product			Construction		Use stage							End-of-life					Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building							
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal		Reuse, Recovery and/or Recycling potential
☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐		☐

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

RCR Flooring Products Ltd
Unit 1C Mill Close
Lee Mill Industrial Estate
Lee Mill
Ivybridge
PL21 9GL

Construction Product

Product Description

Alphajoint is a leave in place armoured formwork floor joint for medium and large scale industrial concrete floors. When in place they protect construction joints from impact damage due to forklift traffic etc.

- Additional important benefits include the creation of a secure boundary or ‘day joint’ during the concrete pour.
- Greater control of concrete contraction which helps prevent random cracks occurring.
- Protection of the arris (edge) when the joint experiences joint impact.
- Plus, efficient load transfer between adjacent concrete slabs.

Thus, maintaining a stable and durable floor.

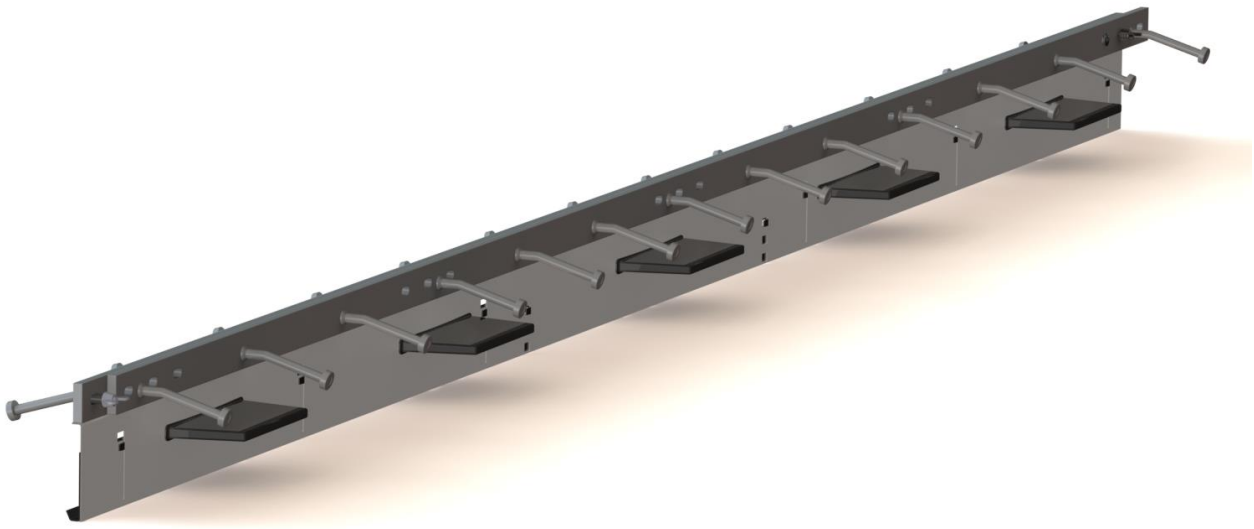
Alphajoint is an environmentally friendly product by being 99% recyclable due to its all-steel construction. Left in place as part of the floor system it is recycled when the building is demolished.

Constructed to BS standard EN1991-1-1:2002 and BS EN 1992-1-1:2004 and to best practice as set out in TR34 4th edition.

Construction is by welding of component parts with 2 in number 40mm deep and 10mm wide flat bright mild steel strips (or Stainless steel for areas requiring them), held together back-to-back by frangible connectors. These are welded to a mild steel base plate form work which holds the strips upper surface, on edge, at the same level as the finished floor surface. Mild steel studs are welded at right angles on the steel strips to hold each strip in place whilst concrete is poured. When the sacrificial connectors open the strips due to contraction of the concrete in which they are embedded, they leave the strip edge arris joint with a perfect right angle on which traffic may pass without causing damage. Dowels placed at suitable centres provide additional load transfer between the concrete slabs and can be of varying thicknesses depending on the thickness of the slab.

Technical Information

Property	Value / Unit
Density at 20 degrees celsius (kg/m^3)	7.85
Melting Point (degrees celsius)	450/1,520
Tensile Strength (N/mm2)	560 Max
Yield Stress (N/mm2)	440 Max
Length manufacturing tolerance (mm)	±2.0
Height manufacturing tolerance (mm)	±1.0
Straightness manufacturing tolerance (mm)	±0.5/600
Nominal slab depth (mm)	150-200; 220 & 240
Joint height (mm)	140-190; 200; 225
Dowel size (mm)	151 x 120 x 8
Dowel centres (mm)	600
Length (mm)	3000
Single joint weight (kg)	33; 35 & 36
No. per bundle	42; 35 & 35
Bundle weight (kg)	1,485, 1,451 & 1,493.4
Standard for joint arris armouring (4010)	EN 10277-1:2008 S235JRC
Standard for sheet steel formwork	BS EN 10130:2006 DC01
Standard for shear stud	EN ISO 13918:2017 S235J2
Standard for plate dowel	BS EN 10025-2:2004 S275JRG2
Material for plate dowel sleeve	HDPP
Slab depth (mm)	Universal divider plate to suit 150-200; 225 & 250
Dowel type	TD6, TD8 & TD10
Unreinforced slab bursting (kN/m)	35.7; 60.7 & 72.4
Unreinforced slab bending (kN/m)	53.4; 87.2 & 124.7



Main Product Contents

Material/Chemical Input	%
Iron	97.76
Magnesium	1.5
Silicon	0.4
Carbon	0.24
Sulphur	0.05
Phosphorus	0.05

Manufacturing Process

The manufacturing process begins with the production of a sub assembly comprising of 2 strips of bright mild steel which are punched at suitable points along their length. Each strip measures 40 x 10 x 3000mm of which only the top 10 mm surfaces are visible when the joint is sunken into an industrial floor. 100mm steel studs are then welded to provide the main anchoring points once the joint has been embedded into the industrial floor. The assembly is completed when 2 strips are placed back-to-back with the use of frangible (sacrificial) fixings, thus creating suitable fixing points (through the stud arrangement) into each concrete pour.

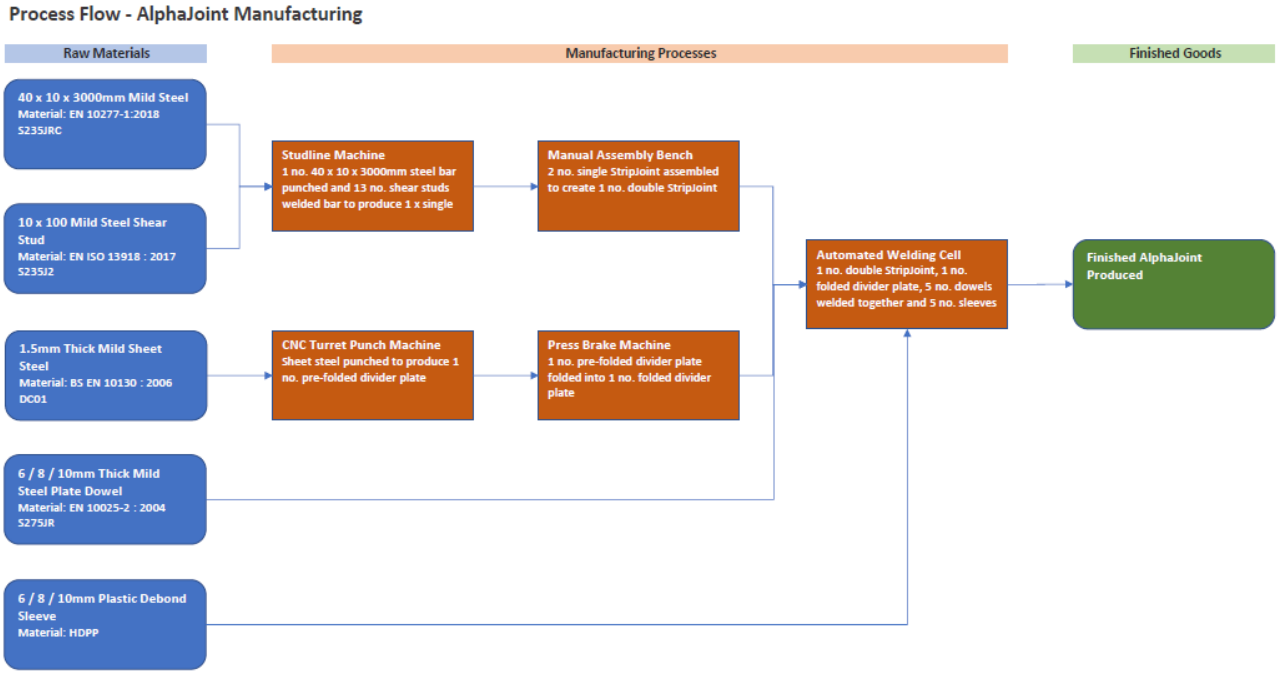
Industrial concrete floors need to be poured in smaller slabs to reduce and help prevent cracks within the finished floor. Alphajoint armoured joints are situated at these slab boundaries to provide a durable arris joint edge which provides a strong surface when driven over by forklift trucks and other pallet/material movement systems within these industrial and warehousing floors.

The second sub-assembly comprises of sheet steel divider plates created from a full size sheet of steel (1.5 x 1250 x 3000mm. These divider plates are punched out on a CNC punch machine to specified sizes to suit the depth of slab. Slots are punched to allow the fixing of dowel plates which provide greater load transfer between each slab when forklifts traverse them. Each individual plate is then folded on a Pressbrake so as to form a short return on one side of the plate, which in turn forms the base of the finished joint when placed onto

the prepared groundworks. In doing this the divider plate also forms a sturdy base for the concrete to be poured up against.

The final process is then to join both sub-assemblies together so that the strips sit atop of the divider plate. At this point the mild steel dowels are welded on one side of the divider plate (passing through it). This process is carried out on a robot jig to ensure correct alignment of both assemblies (ensuring that only one strip is welded to the divider plate). This allows the joint to open when the concrete contracts, thus leaving a strong square edge which helps protect the slabs from impact damage.

Process flow diagram



Life Cycle Assessment Calculation Rules

Declared unit description

1 unit of Alphajoint (33.15 kg)

System boundary

This is a cradle-to-gate EPD, reporting all production life cycle stages (modules A1 to A3) in accordance with EN 15804:2012+A1:2013.

Data sources, quality and allocation

Specific primary data derived from the Alphajoint production process in Ivybridge, UK have been modelled using BRE LINA v2.0 and the BRE LINA database v2.1.27. In accordance with the requirements of EN15804, the most current available data has been used. The manufacturer-specific data from RCR Flooring Products Limited covers a period of one year (01/01/21 – 31/12/21). Secondary data has been obtained for all other upstream and downstream processes that are beyond the control of the manufacturer (i.e. raw material production) from the ecoinvent 3.2 database. All ecoinvent datasets are complete within the context used and conform to the system boundary and the criteria for the exclusion of inputs and outputs, according to the requirements specified in EN15804. Calculations were performed to enable allocation of processes to the

Alphajoint product. Allocation procedures were by physical allocation and are according to EN15804 and are based on ISO14044 guidance.

Quality Level	Geographical representativeness	Technical representativeness	Time representativeness
Very Good	Data from area under study.	Data from processes and products under study. Same state of technology applied as defined in goal and scope (i.e. identical technology).	n/a
Fair	n/a	n/a	There is approximately 5-6 years between the ecoinvent LCI reference year, and the time period for which the LCA was undertaken.

Specific European and UK datasets have been selected from the ecoinvent LCI for this LCA. The quality level of geographical and technical representativeness is therefore Very Good. The quality level of time representativeness is Fair as the background LCI datasets are based on ecoinvent v3.2 which was compiled in 2015. There is approximately 5-6 years between the ecoinvent LCI reference year and the time period for which the LCA was undertaken.

Cut-off criteria

All raw materials, packaging materials, transportation, process energy, general energy, water use and production waste have been included where appropriate. Only direct emissions to air, water and soil, which are not measured, and lubrication oil which has negligible consumption, have been excluded. There is no non-production waste produced at the Lee Mill Works site.

LCA Results

Parameters describing environmental impacts

			GWP	ODP	AP	EP	POCP	ADPE	ADPF
			kg CO_2 equiv.	kg CFC 11 equiv.	kg SO_2 equiv.	kg $(PO_4)^{3-}$ equiv.	kg C_2H_4 equiv.	kg Sb equiv.	MJ, net calorific value.
Product stage	Raw material supply	A1	8.26e+1	4.69e-6	4.02e-1	2.25e-1	8.83e-2	7.73e-4	1.07e+3
	Transport	A2	2.35e+0	4.08e-7	9.23e-3	2.75e-3	1.46e-3	5.95e-6	3.52e+1
	Manufacturing	A3	-2.74e+0	1.99e-7	1.45e-2	3.73e-3	3.09e-3	6.28e-6	5.96e+1
	Total (of product stage)	A1-3	8.22e+1	5.30e-6	4.26e-1	2.31e-1	9.28e-2	7.85e-4	1.16e+3

GWP = Global Warming Potential;
ODP = Ozone Depletion Potential;
AP = Acidification Potential for Soil and Water;
EP = Eutrophication Potential;
POCP = Formation potential of tropospheric Ozone;
ADPE = Abiotic Depletion Potential – Elements;
ADPF = Abiotic Depletion Potential – Fossil Fuels;

Parameters describing resource use, primary energy

			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	7.91e+1	2.43e-4	7.91e+1	1.15e+3	0.00e+0	1.15e+3
	Transport	A2	9.50e-1	2.04e-6	9.50e-1	3.63e+1	0.00e+0	3.63e+1
	Manufacturing	A3	7.07e+1	2.68e-5	7.07e+1	6.68e+1	0.00e+0	6.68e+1
	Total (of product stage)	A1-3	1.51e+2	2.72e-4	1.51e+2	1.25e+3	0.00e+0	1.25e+3

PERE = Use of renewable primary energy excluding renewable primary energy used as raw materials;
PERM = Use of renewable primary energy resources used as raw materials;
PERT = Total use of renewable primary energy resources;
PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials;
PENRM = Use of non-renewable primary energy resources used as raw materials;
PENRT = Total use of non-renewable primary energy resource

Parameters describing resource use, secondary materials and fuels, use of water

			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m^3
Product stage	Raw material supply	A1	0.00e+0	0.00e+0	0.00e+0	1.81e+0
	Transport	A2	0.00e+0	0.00e+0	0.00e+0	1.02e-2
	Manufacturing	A3	0.00e+0	0.00e+0	0.00e+0	3.72e-2
	Total (of product stage)	A1-3	0.00e+0	0.00e+0	0.00e+0	1.86e+0

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;
NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	1.57e+1	6.72e+0	2.45e-3
	Transport	A2	2.23e-2	1.41e+0	2.44e-4
	Manufacturing	A3	3.95e-2	2.41e-1	1.92e-4
	Total (of product stage)	A1-3	1.58e+1	8.37e+0	2.89e-3

HWD = Hazardous waste disposed;
NHWD = Non-hazardous waste disposed;
RWD = Radioactive waste disposed

Other environmental information describing output flows – at end of life						
			CRU	MFR	MER	EE
			kg	kg	kg	MJ per energy carrier
Product stage	Raw material supply	A1	0.00e+0	0.00e+0	0.00e+0	0.00e+0
	Transport	A2	0.00e+0	0.00e+0	0.00e+0	0.00e+0
	Manufacturing	A3	0.00e+0	1.89e+0	0.00e+0	0.00e+0
	Total (of product stage)	A1-3	0.00e+0	1.89e+0	0.00e+0	0.00e+0

CRU = Components for reuse;
MFR = Materials for recycling
MER = Materials for energy recovery;
EE = Exported Energy

References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013. London, BSI, 2013.

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